

THE ATLANTA BELTLINE:

THE BEGINNING OF AN INTEGRATED BIKE NETWORK

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How is the BeltLine impacting bicycle and pedestrian connectivity
and how can Atlanta optimize this potential?

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INTRODUCTION

"The car is now the defining technology of our built environment. Somewhere along the continuum from convenience to congestion, the auto dominates what were once diverse streets shared by pedestrians, bikers, shoppers, trolleys and cars."

- Peter Calthorpe

As a culture dependent on the automobile, we have created a world in which it is impractical, if not impossible, to travel by any other means of transportation. We have made our cities larger and less dense, producing places much less convenient for the people living in them. In many neighborhoods, it is no longer feasible to walk to work or let children bike to school because our city streets have turned into busy roads that no longer accommodate the diversity of users they once did.

According to the National Highway Traffic Safety Administration (NHTSA), 630 bicyclists were killed in the U.S. in 2009 and another 51,000 were reported as injured in motor vehicle traffic crashes. This same data shows that 4,092 pedestrians were killed in 2009, with an estimated 59,000 reported injured. These facts illustrate that "On average, a pedestrian was killed every two hours and injured every nine minutes in traffic crashes" (NHTSA's National Center for Statistics and Analysis, 2011).

The current state of safety on our streets for cyclists and pedestrians demonstrates a need for vast improvements. In the legal realm, motorists have the superiority while pedestrians and cyclists are victims of hit and run incidents on a daily basis. Many recent instances, both in and out of the court system, have shown that pedestrians and cyclists are not provided the same rights as those operating a vehicle when it comes to the roadway.

In many cities, including Atlanta, 5 lane high-speed roadways frequently traveled by primary public transit routes lack the infrastructure to support those using the transit system. Sidewalks are inconsistent, deteriorating or just entirely nonexistent while designated crosswalks are few and far between. These conditions make it difficult, if not impossible, for those without vehicles to travel safely by foot to places of necessity. This also begins to demonstrate the immense inequity in the

current transportation system. For those who are obligated to travel distances too far to go by foot, they venture on bicycle; most in this situation are too fearful of the road conditions to ride where they are required by law.

All of these factors contribute to a need for improved bicycle and pedestrian facilities, be it on-street or off-street accommodations. The city of Atlanta must develop a network of safe and comfortable routes in order to support those who use alternative transportation. The Atlanta BeltLine is a project currently underway that has the potential to initiate development of this greatly needed infrastructure. However, analysis has yet to be done showing if and how this project will contribute to a larger framework of connectivity for pedestrians and cyclists. This paper aims to answer the question, “How is the BeltLine impacting bicycle and pedestrian connectivity and how can Atlanta optimize this potential?” A literature review will summarize existing research supporting similar bike network development techniques in other cities throughout North America. The approach taken to establish additional research supporting the hypothesis will be described prior to the revelation of the actual data analysis. Finally, the paper will conclude with policy recommendations based on the outcome of the data analysis.

LITERATURE REVIEW

Greenways, trails and pathways have long been used for recreational purposes, but many cities are beginning to realize the potential for the systems to promote non-motorized transportation (Erickson, 2006). However, minimal attention has been given to the linkage of greenway systems into larger urban networks, for which this study aims to develop a richer understanding. Greenways could provide the connectivity to support a more extensive bike network and encourage more cycling. A significant portion of daily trips are shorter than five miles, making the use of a bicycle for transportation quite feasible. In fact, almost 50% of all trips made in the

United States in 2001 were less than three miles (Morris, 2004). The average cyclist can travel a distance of three miles within approximately twenty minutes and will typically travel between one and three miles to reach a destination (McNeil, 2010). It is evident that traveling by bike is a realistic option, yet most trips are still made by car.

In a report from the Rails-to-Trails Conservancy, the argument is made that “it is not the lack of desire to make trips by bicycle but rather a lack of opportunity” (Morris, 2004). This lack of opportunity derives from a general absence of safe facilities for cyclists, which is a primary concern for those with an interest in cycling. According to a report by the Portland Office of Transportation, 60% of people are categorized as “interested, but concerned,” meaning they will only ride under conditions in which they feel safe or are separated from vehicular traffic (Geller, 2005). If cities are to successfully promote cycling as a mode of transportation, they must provide the facilities necessary to encourage more riders. In designing these facilities, certain elements must be considered. The three most important factors influencing a person’s decision to commute by bike are: 1) the distance of travel to their destination; 2) the directness of available bicycle routes; and 3) the connectivity between routes and to transit stations (Nuworsoo, Cooper, Cushing, & Jud, 2012). Literature discussing cities throughout North America with significant bicycle networks will be reviewed to gather information on how they have addressed these factors through the integration of greenways into the urban fabric using various types of bike facilities.

CONNECTIVITY ACROSS FACILITIES

There are many different types of bicycle facilities, but they all generally fall under the categories of either off-street or on street. Off-street facilities are typically multi-use trails that are removed from vehicular traffic in order to enhance the

experience of non-motorized transportation. Traditionally, off-street facilities have been used for recreational purposes rather than transportation. Greenways and parkway trails are notable examples of off-street facilities. On-street facilities include any enhancement of street infrastructure for bicycle use, such as striping of bike lanes, marking of shared lanes, or construction of cycle tracks. A more extensive description of the multitude of existing facilities can be seen in Chart 1.

Chart 1. List and description of bicycle facility types adapted from Pucher, Dill, & Handy, 2010

Facility Type	Facility Description
Greenway	Off-street path that is generally associated with a body of water, old railroad infrastructure, or other significant right-of-way
Pathway	Off-street paths paved and separated from motor vehicle traffic. Pathways can be mixed use (including pedestrians, rollerbladers, etc.) or limited to cyclists
Trail	Typically used to describe unimproved recreational facilities, but in this report refers to a pathway-type facility
Cycle Track	Similar to bike lanes, but are physically more separated from motor vehicles, for example with a curb, vehicle parking, or other barriers
Bike Lane	On-street facility separated from vehicular traffic by lane striping
Bike Boulevard	Signed bicycle routes, usually on low-traffic streets, that include other traffic calming features to discourage motor vehicle traffic, such as speed bumps, diverters and traffic circles
Shared Lane/Sharrows	Shared lane markings (or sharrows) are used in lanes shared by motor vehicles and bicycles to alert drivers to the potential presence of cyclists and to show cyclists where to ride
Signed Bike Route	A shared roadway which has been designated by signing as a preferred route for bicycle use
Bikeway	Any on-street facilities that allow access for bicycle travel, but vary in the status they give cyclists. Can include: signed bike routes, shared roadways, wide curb lanes, marked bike lanes, etc.

No matter what the type of facility, it is absolutely critical that it be connected to a larger network of bicycle infrastructure. A network is defined as a system of nodes and corridors or hubs and links, wherein the nodes or hubs are connected to each other by way of the corridors or links (Erickson, 2006). The ideal bicycle infrastructure establishes network connectivity, separates bicyclists from vehicular traffic and provides them with the most direct routes to their destinations (Nuworsoo et al., 2012). A physically separated facility running directly adjacent to

a major vehicular route is a prime example of this ideal infrastructure, as vehicular routes typically connect principal destinations. If a bikeway does not link riders to destinations, it is not likely to attract much use.

HOW HAVE OTHER CITIES USED URBAN BIKE TRAILS TO CREATE A LARGER INTEGRATED BIKING NETWORK?

Studies of Calgary, Alberta; Vancouver, British Columbia; and Denver, Colorado have shown that cities can successfully integrate separated bicycle facilities, typically used for recreation, into a larger urban fabric of on street bicycle facilities to establish connectivity and encourage greater use of non-motorized transportation. According to the Rails-to-Trails Conservancy report, there are a number of characteristics that contribute to successful commuting trails: trails located near residences (within a mile or so) are more likely to be used for commuting; trails abutting multiple land uses (employment centers, schools, etc.) provide more access for users; numerous access points along a trail encourage more use; longer trails are able to connect to more destinations; and a network of trails can reach more destinations than a single trail (Morris, 2004). The following questions seek to identify how the three cities have addressed these characteristics, as well as others mentioned previously, through the development of their urban bicycle networks.

WHAT OPPORTUNITIES WERE THESE CITIES ABLE TO CAPITALIZE ON?

Various infrastructure elements exist in most cities that have the potential to be utilized in the development of bicycle facility networks. Some cities have been successful in using these features as the backbone of their bikeway network. Significant features that have traditionally provided generous opportunities for bikeway network development include: river corridors and other waterfront right-of-way, historic parkways, railroad corridors, highway right-of-way and existing grid network street infrastructure (Erickson, 2006). The three case study cities

offer insight into how these structures can be, and have been, used to establish comprehensive urban bike networks.

The city of Calgary began creating its internationally recognized, non-motorized path system in the early 1970's. With the implementation of a Pathways Program in 1974, the city started constructing paths with the goal of simply providing recreational trails. Pathways were built along the two major rivers flowing through the city limits and eventually connected into parks and other recreational features in the city. By 1994, over 180 miles of pathways had been completed and were heavily used by local residents. In the year 2000, the city adopted its first Pathway and Bikeway plan, which began shifting the focus away from recreation and turning it more toward transportation. The critical element in the equation for Calgary was, thus, the availability of land within the river corridors that allowed the city to build extensive greenways for cyclists. (Erickson, 2006)

Similar to the city of Calgary, Denver also built its bicycle network up from a greenway system developed along its own inner-city river. Downtown Denver formed around what is known as the Central Platte River Valley, which is also the focal point of the city's bike network. In 1974, the city created the Platte River Development Committee, which later became known as the Greenway Foundation. With all of the industrial development going on at the time, the Platte River had become polluted, which led to the city initiating an expansive revitalization effort. The Foundation was responsible for this effort and raised millions of dollars to create trails, parks and other important civic spaces while remediating the conditions of the river. (Erickson, 2006)

In contrast to Calgary and Denver, Vancouver provides a unique example of how a city can utilize its existing street network to develop a substantial "greenway" system. An Urban Landscape Task Force (ULTF) was appointed by the mayor in

1991 to evaluate the city's urban landscape. This task force prepared a report recommending development of a citywide greenway network that was adopted by the city council in 1995. By this time, the city had already been extensively built out and lacked the space that cities like Denver and Calgary were able to capitalize on. However, the existing street grid afforded a pivotal opportunity for Vancouver. Minor city streets, with minimal traffic, running parallel to major arterial routes were suitable, existing corridors that could easily be transformed into public "greenways." With the guidance of the ULTF, the city Engineering Department began converting these vehicular streets into low-speed, traffic-calmed bicycle boulevards, which they have designated as citywide greenways. (Erickson, 2006)

HOW WERE THESE NETWORKS SUCCESSFULLY INTEGRATED INTO THE URBAN FABRIC?

Calgary, Denver and Vancouver provide examples of how greenways can be integrated into the urban fabric, both through planning and development as well as by retrofitting existing development. These cities, and the history of their bike networks, will be analyzed to better understand how this integration was accomplished.

When the city of Calgary adopted its Pathway and Bikeway plan in the year 2000, it divided the bicycle network into two systems; one for recreational purposes and the other for non-motorized transportation (Erickson, 2006). This plan also contained a set of guiding principles to ensure proper planning and development of the network. Three main objectives were identified in the plan, including: 1) connect regional and national pathways, 2) develop city policy to require developers to build new connections into the system, and 3) create a comprehensive network of pathways and bikeways (Erickson, 2006). According to the Pathway and Bikeway plan, local pathways and a bikeway system supplement a citywide, regional pathway system (The City of Calgary, 2000). The local pathways serve as the secondary links

between community destinations and also connect into the regional pathway system. Because pathways are strictly off-street facilities, they cannot provide a continuous network within the core of the city. The bikeway system establishes the missing links between pathways by acting as the seams that integrate the pathways into the urban fabric. Bikeways are any on-street facilities that allow access for bicycle travel, but vary in the status they give cyclists. In Calgary, bikeways include: signed bike routes, shared roadways, wide curb lanes, marked bike lanes or bicycle corridors (The City of Calgary, 2000). With over 400 miles of pathways and almost 200 miles of on-street bikeways, which can be seen in Appendix A, Calgary provides its cyclists with an extensive system for non-motorized transportation ("Pathways and Bikeways," 2011).

In 1977, when the Platte River Development Committee became the Greenway Foundation, Denver shifted the responsibility of developing the greenway system from the government to a non-profit organization. This allowed the city to accept public and private funds through the Foundation (over \$14 million in seven years) that were directed straight into the construction of trails. The Foundation expanded to include only the development of regional trails, while several smaller entities formed within local communities that took over development of more localized trails to provide connectivity. As a result of this citywide commitment to greenway connectivity, Denver has been recognized for having the Nation's most extensive urban greenway network. In a similar fashion to Calgary, Denver has created a feeder network of urban, on-street facilities that link the greenway network to destinations not otherwise accessible. (Erickson, 2006) the Denver region boasts almost 200 miles of on-street bike lanes and nearly 2,000 miles of multi-use trails, which can be seen in Appendix B (Denver Regional Council of Governments, 2009).

The City of Vancouver, as stated previously, has a unique history in the development of its urban bike network. The city organized its bike network into a multi-tiered system, which can be seen in Appendix C, including a primary network of City greenways, a secondary network of Neighborhood greenways and a supplementary network of bikeways. The greenway system is designed to encourage the non-experienced cyclists to ride in the city by providing safe and comfortable routes for them to use. City greenways are the responsibility of the city Engineering Department and are, for the most part, located within street right-of-way. The 14 existing City greenways are concentrated in areas with a higher number of destinations and greater population densities, and span almost 100 miles. Neighborhood greenways, on the other hand, are smaller in scale and scope, are generally shorter routes and they connect local community amenities. These greenways are community driven and are meant to connect the community residents to their destinations by linking into the larger framework of City greenways. The network of bikeways is a citywide system geared towards more experienced, and typically commuter, cyclists. Bikeways in Vancouver are similar to those in Calgary; they are on-street facilities that are either separated from vehicular traffic or include traffic calming devices to give priority to cyclists. This network includes over 300 miles of various facilities for bikes. ("Greenways for Walking and Cycling," 2012)

WHAT TYPES OF ORGANIZATIONS WERE NECESSARY TO PROMOTE, FUND AND DEVELOP THESE NETWORKS?

In the city of Calgary, the Parks & Recreation department collaborates with the Transportation Department in order to better integrate the on street and off-street facilities (The City of Calgary, 1996). These two departments have staff dedicated to bicycle and pedestrian policy, design and planning and provide regular training for those staff members (The City of Calgary, 2011). Different segments of government

work together on projects within the greenway network and politicians see the projects as tangible elements of city planning and expenditures. For these reasons, Calgary is able to budget ample funding for development and maintenance of the greenway network. The city even prioritizes funds for filling in missing links within the network (Erickson, 2006). Prior to 2006, there was only funding for multi-use pathways, or greenways, but as of 2009 the city had dedicated four percent of its transportation infrastructure budget specifically to bicycle infrastructure (The City of Calgary, 2011). For the ten-year period from 2009-2018, that equates to \$126 million in funds for pedestrian and bicycle projects (The City of Calgary, 2011).

Denver's Greenway Foundation was an integral part of funding and support for expansion of the greenway network in the city. Through the Foundation, the Mayor allocated \$1.9 million for creation of trails and parks, the Gates Foundation contributed \$780,000, and another \$14 million was raised over a period of seven years. A state government program, entitled Great Outdoors Colorado (GOCO), was another key to the success of Denver's greenway network. GOCO raises funds through the state lottery and distributes those funds to municipalities through a competitive grant process. This grant program encourages multi-jurisdictional projects, leading to incredible efforts of collaboration amongst and between all parties. Leadership within the government, city and non-profit partnerships, and the continued renewal of locally funded programs are the three major contributors to the bike network in the city of Denver (Erickson, 2006). The most recent update to the Denver Regional Transportation Plan included an estimate for \$700 million in potential funding for bicycle and pedestrians projects through the year 2035, out of a \$93 billion budget (Denver Regional Council of Governments, 2009).

As Vancouver's City greenway network is managed by the city's Engineering Department, it is only fitting that the city's capital budget is the primary source of its

funding. Out of a transportation budget of \$52 million, walking and cycling will receive a little over \$15 million for 2012 (City of Vancouver, 2012). In 2010, the Vancouver Council approved a \$25 million plan to improve bicycle facilities citywide by 2011 (Keam, 2010). Funds also come from other levels of government, non-profit organizations, business associations or donations (Erickson, 2006). Neighborhood greenways are the responsibility of the community's initiating the planning. These greenways are only partly funded by the city, with the community supplementing funds or providing in-kind contributions (Erickson, 2006). Another, less significant, but viable source of funding comes from the Greater Vancouver Regional District (GVRD). The GVRD is a federation of municipalities that assembles funds from the region to disperse back to municipalities, but has such a complex process that it is difficult to retrieve funding for the greenway network (Erickson, 2006).

HOW DO THESE NETWORKS PERFORM IN COMPARISON TO CITIES WITHOUT SUCH WELL-INTEGRATED SYSTEMS?

In the United States in 2009, the share of daily work trips made by bicycle amounted to a measly 1.0%, while countries like Denmark and the Netherlands reported 18% and 25% for all trip purposes, respectively. The amount and quality of bicycle facilities, not to mention the connectivity they provide, in the cities of Denmark and the Netherlands significantly contributes to the large share of bicycle trips in those countries. Canada, like the U.S., has a much smaller share of bike-to-work trips, reporting only 1.0% for the entire country in 2006. The highest ranked city in the United States is Portland, Oregon, with a bicycle mode share in 2008 of 6.0%, while Victoria, British Columbia holds the top spot for Canadian cities with 5.0%. Portland is a city that has started following the examples set by Danish and Dutch cities, developing a noteworthy bicycle network and encouraging more cyclists through major changes in city policy to support cycling. In Denmark, the capital city of

Copenhagen reported 29% bicycle mode share, while the Dutch city with the highest ranking was Groningen with a generous 38% (Alliance for Biking & Walking, 2012).

The city of Calgary has cultivated one of the highest bicycle mode shares in Canada with 2% of people cycling to work in 2008 (Alliance for Biking & Walking, 2012).

The bike network has become so renowned that businesses moving into the city of Calgary have started requesting bicycle count reports so as to locate near the busiest bike routes (Erickson, 2006). In 2009, Denver recorded growth up to 1.8% bicycle mode share, placing the city at the ranking of 9th highest share of people cycling to work in the United States (Alliance for Biking & Walking, 2012). Denver's path network has become so crowded, that the city is expanding the system to separate bicycle and pedestrian traffic (Erickson, 2006). The city of Vancouver reached a mode share of 1.9% in 2006, just slightly above the 1.0% for the country (Transport Canada, 2010). For comparison, in 2009 the city of Atlanta, with its lack of bicycle facilities, had only 0.8% of commuters cycling to work (Alliance for Biking & Walking, 2012). Cities like Dallas, San Antonio, Omaha, and Oklahoma City, with little bicycle infrastructure, have the lowest share of bike trips in the country, reporting rates below 0.3%. Though these cities, too, are beginning to plan larger and more connected bike networks to encourage more cycling.

CONCLUSION

Cities throughout North America are realizing the potential that greenways provide for developing larger, more integrated bicycle networks. Denver, Calgary and Vancouver are only three examples of cities that have begun these transformations to encourage more cycling for transportation. Unfortunately, much of the available data on mode share is more than three years old, so it does not accurately reflect the current status of cycling in these cities. It is very possible that these efforts have seen amplified results in more recent years as cyclists begin using the new systems.

This lag in data availability makes it difficult to analyze the effectiveness of the bike networks that have been just been developed and are still expanding.

When analyzing the bicycle facilities in Atlanta and the city's potential for a larger, integrated network, these three cities will provide much insight as to how such a system could be created. These cities were chosen specifically because they have utilized greenways as primary contributors to their bicycle networks, which establish precedents for the City of Atlanta with its BeltLine project. They each offer their own lessons on the possibilities for infrastructure, connectivity design, policy changes, and funding options to ensure success. The same questions will be addressed within the context of Atlanta, concerning what opportunities exist that the city could capitalize on; how new facilities could be integrated into the existing urban fabric; and what organizations exist that could be pivotal in the development of this network. Data will be collected from cyclists currently riding in the city and providing GPS information regarding their route choices through the Cycle Atlanta smartphone application. The data will be used to track corridors of significant usage throughout the city and to deduce whether or not the Atlanta BeltLine will provide a pivotal opportunity for bike connectivity. This research aims to provide information that will assist the City of Atlanta in developing a larger, connected and successful network of bicycle facilities so as to increase the percentage of bicycle mode share in the city.

RESEARCH APPROACH

This paper seeks to identify how the Atlanta BeltLine can better serve cyclists in the city through analysis of user data collected by the Cycle Atlanta smartphone application. These two projects are citywide efforts to improve the general livability of the City of Atlanta through the creation of additional opportunities for alternative transportation. The following section will provide an overview of these two projects

and then discuss how the data collected from the Cycle Atlanta application will be used for analysis of the BeltLine.

PROJECT REVIEW

The Atlanta BeltLine is a network of predominantly abandoned rail lines that forms a perimeter around the central core of the city. Originally conceived as a master's thesis in 1999, the BeltLine project has become an unprecedented revitalization effort, attempting to redevelop the existing rail corridor into a multi-modal greenway that can be seen in Figure 1. This project will add over 1,200 acres of new parks to the city, as well as 33 miles of trails that could provide connectivity for cycling in Atlanta. The 22-mile rail corridor links 45 in town neighborhoods, creating a unique opportunity for community connectivity and accessibility ("Atlanta BeltLine Overview," 2013).

Plans for the project include eventually developing the corridor into a light rail transit network that will connect into the existing MARTA heavy rail system. The transit aspect of the project has proven to be a contentious concept throughout the community, while developing the corridor strictly as a bicycle and pedestrian pathway has received much enthusiasm. The BeltLine project has already completed 6 new parks within the City of Atlanta and opened three trail segments of the planned 33 miles network ("Atlanta BeltLine Overview," 2013). These segments include the West End Trail, the Northside Trail and the Eastside Trail; of which the Eastside Trail will be a particular focus in this research.

Atlanta BeltLine, Inc. (ABI) is the organization in charge of planning and implementation of the BeltLine project. ABI works in conjunction with the City of Atlanta, the Atlanta BeltLine Partnership and a design team lead by Perkins + Will to manage the project and ensure its success. The Atlanta BeltLine Partnership is a non-profit organization formed to work with neighborhoods and other community

groups to raise funds, awareness and address social concerns related to the project. A variety of federal, state, local and private funds provide the resources necessary for redevelopment of the Atlanta BeltLine (“Atlanta BeltLine Overview,” 2013).

Figure 1. Conceptual diagram of the Atlanta BeltLine from www.beltline.org

The Atlanta BeltLine is a 33-mile loop around the center of the city that is currently being redeveloped as trail system. In conjunction with the construction of the trails are plans for light-rail transit within the corridor.

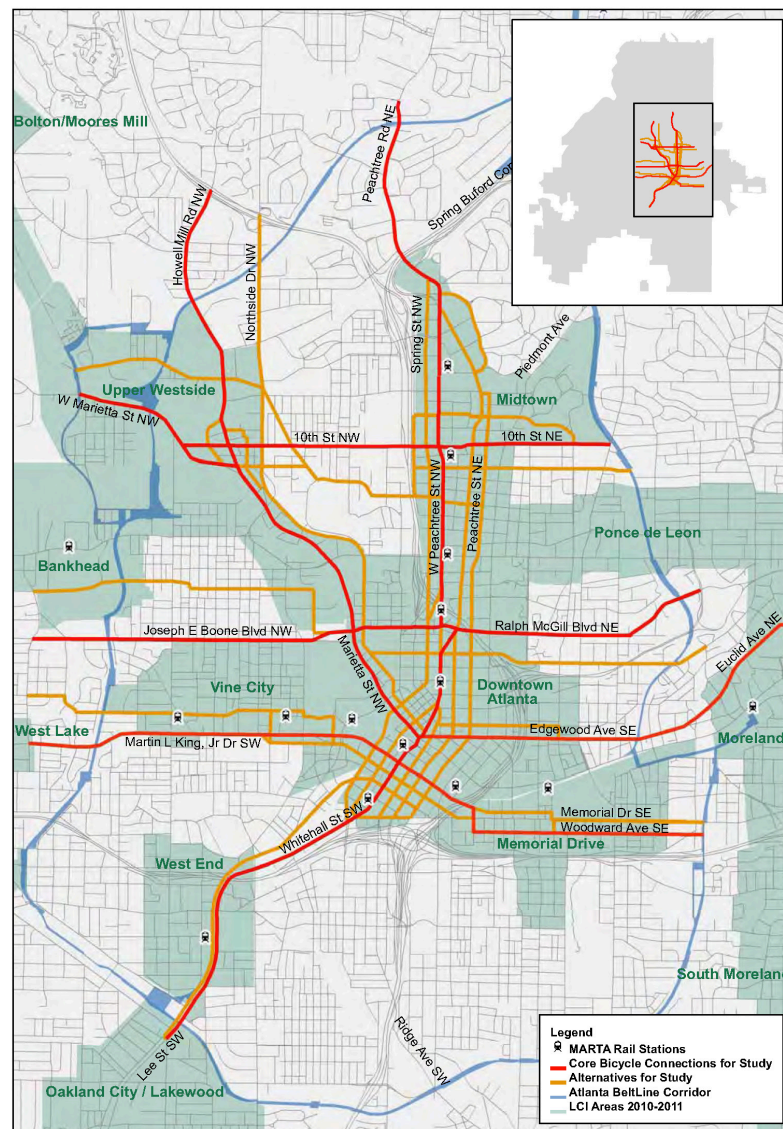


The Cycle Atlanta project is an initiative to support cycling as a mode of transportation in the central core of the city. The City of Atlanta Department of Planning & Community Development, Georgia Tech, the Atlanta Bicycle Coalition (ABC) and the Atlanta Regional Commission (ARC) are all partners in this endeavor, which was proposed in December of 2011. Through a phased study of five selected

corridors within the limits of the Atlanta BeltLine, seen in Figure 2, the City of Atlanta aims to increase the number of safe routes for cyclists by improving the bicycle facility network. This study includes significant data collection through the use of the Cycle Atlanta smartphone application, which will be referenced in this research paper as a data source. The Cycle Atlanta application was developed by a research team at Georgia Tech based on the Cycle Tracks application created for the San Francisco County Transportation Authority (City of Atlanta, 2011).

Figure 2. Map of Cycle Atlanta Primary Corridors from www.cycleatlanta.org

The Cycle Atlanta plan identifies five major corridors to be analyzed for bikeability. These routes will be studied to determine whether or not it is feasible to construct new bicycle facilities.



PROCESS

In order to determine how much potential the BeltLine has to influence a larger bicycle network for the city, the following approach will be taken to guide all research. Because the BeltLine Eastside Trail is mostly complete, it provides the best information from a usage standpoint and will be the focus of this data analysis. However, the remainder of the BeltLine trail system will also be evaluated for its potential to serve future trips, if and when it should be completed. The primary questions that all data analysis will aim to answer include:

1. *Are cyclists using the existing BeltLine Eastside Trail?*
2. **How** *are cyclists using the existing BeltLine Eastside Trail?*
3. *Is the existing BeltLine Eastside Trail connecting cyclists to particular destinations?*
4. *Could the existing BeltLine Eastside Trail be used to serve other trips?*
 - a. *What parallel routes are being used for trips that could be better served by the BeltLine in conjunction with adjacent streets?*
5. *Does the remainder of the BeltLine show potential to be used when completed?*
6. *What locations does/will the BeltLine serve?*

Data collected from the Cycle Atlanta smartphone application will be geocoded into Geographic Information System (GIS) software and overlaid on the City of Atlanta street network. This includes all data collected from users between the release date of the application in October 2012 and the end of the month January 2013. Trips recorded in the data will be illustrated on the street network and those that utilize the existing BeltLine Eastside Trail will be isolated for further analysis. This will help to determine *how* cyclists are using the BeltLine trail and what areas the trail is serving. It will also provide information as to which routes are most heavily used in

conjunction with the BeltLine and could benefit from bicycle facilities. Origins and destinations of all trips at least partially occurring on the BeltLine Eastside Trail will be identified to determine what significant destinations the BeltLine is currently serving. Trips not occurring on the BeltLine will also be examined with the intent of assessing future potential of the BeltLine trail.

THE ANALYSIS

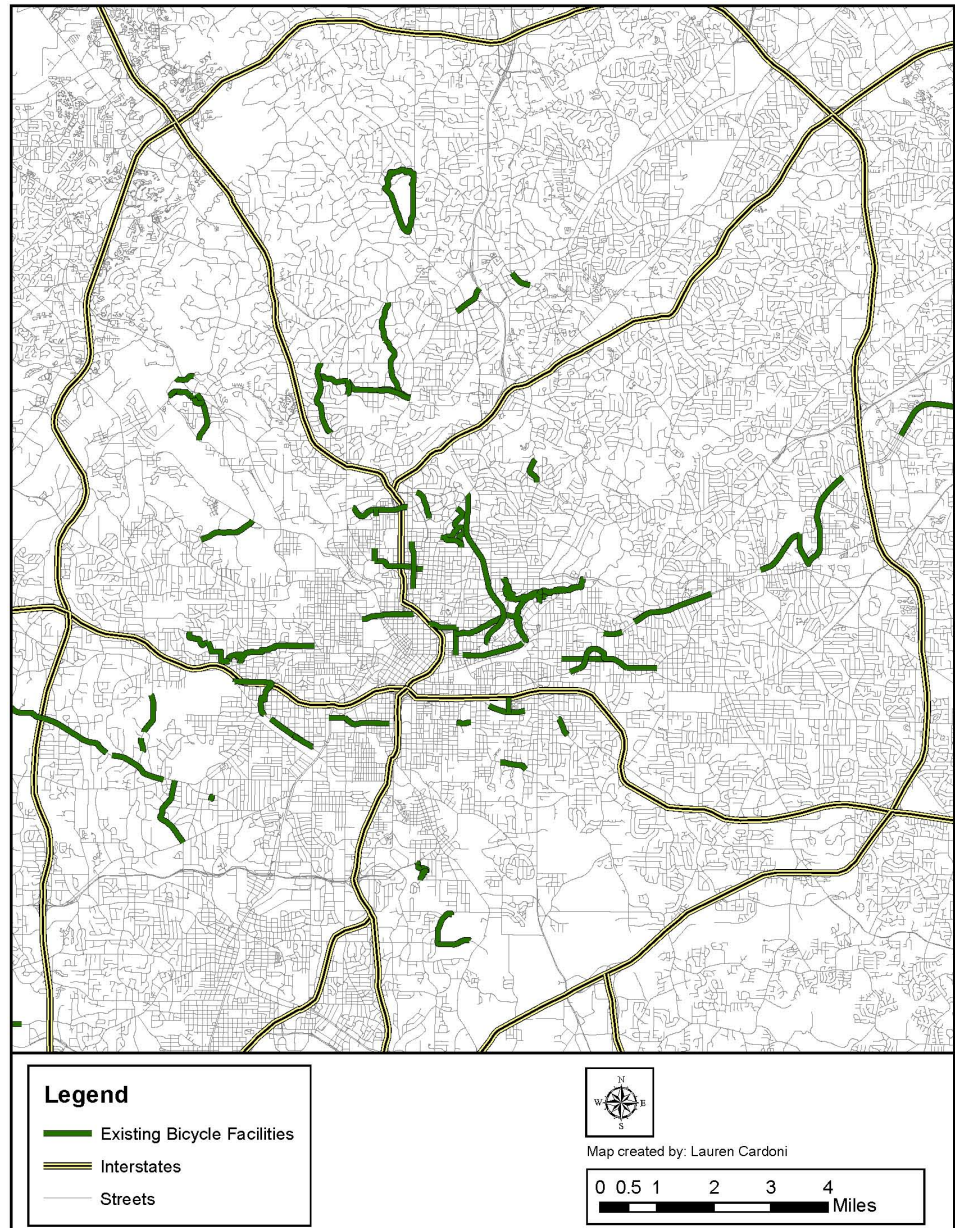
As mentioned previously, the Cycle Atlanta smartphone application data will be analyzed to determine where cyclists in the city are riding and if they are using the BeltLine for a segment of their trips. A secondary analysis will be done to observe trips that are not currently using the Eastside Trail, but could be better served by extension of the BeltLine trail system. The following paragraphs will describe the results obtained from the analysis process outlined in the preceding research approach section.

RESULTS

The City of Atlanta currently maintains roughly 60 miles of dedicated bicycle facilities. This includes approximately 34 miles of bike lanes and 29 miles of separated, multi-use pathways (“City of Atlanta Bicycle Transportation Initiatives,” 2013). As you can see in Figure 3 on the following page, these facilities are few and far between, with very little connectivity amongst them. Facilities like these are not as encouraging for new riders, as they do not provide a continuous, safe route to any destination. Many of these facilities are also located in areas where they do not serve many riders. However, a majority of these facilities have the potential to develop into a larger, more connected network that will serve more trips. The BeltLine has the potential to provide this connectivity between facilities for cyclists, which is what this analysis seeks to determine.

Figure 3. Map of Existing Bicycle Facilities in Atlanta

Existing bicycle facilities in Atlanta include 34 miles of bike lanes and 29 miles of shared-use pathways. Connecting these facilities through construction of new ones would provide a continuous and safe network for cyclists.



The map shown in Figure 4 on the following page displays these existing bicycle facilities in addition to the planned alignment of the entire BeltLine trail. Figure 5 exhibits a larger scale image of the area surrounding the BeltLine and existing bicycle facilities to illustrate how many potential destinations this larger connected network could serve. The proximity of MARTA rail stations also provides the

opportunity for integration of bikes and transit to increase the coverage of the MARTA system as well as its accessibility.

Figure 4. Map of Existing Bicycle Facilities and Proposed BeltLine Trail

The BeltLine trail has the potential to connect the disjointed network of bicycle facilities in the city. The trail will introduce significant new north-south options for cyclists currently restricted to heavy-traffic arterials.

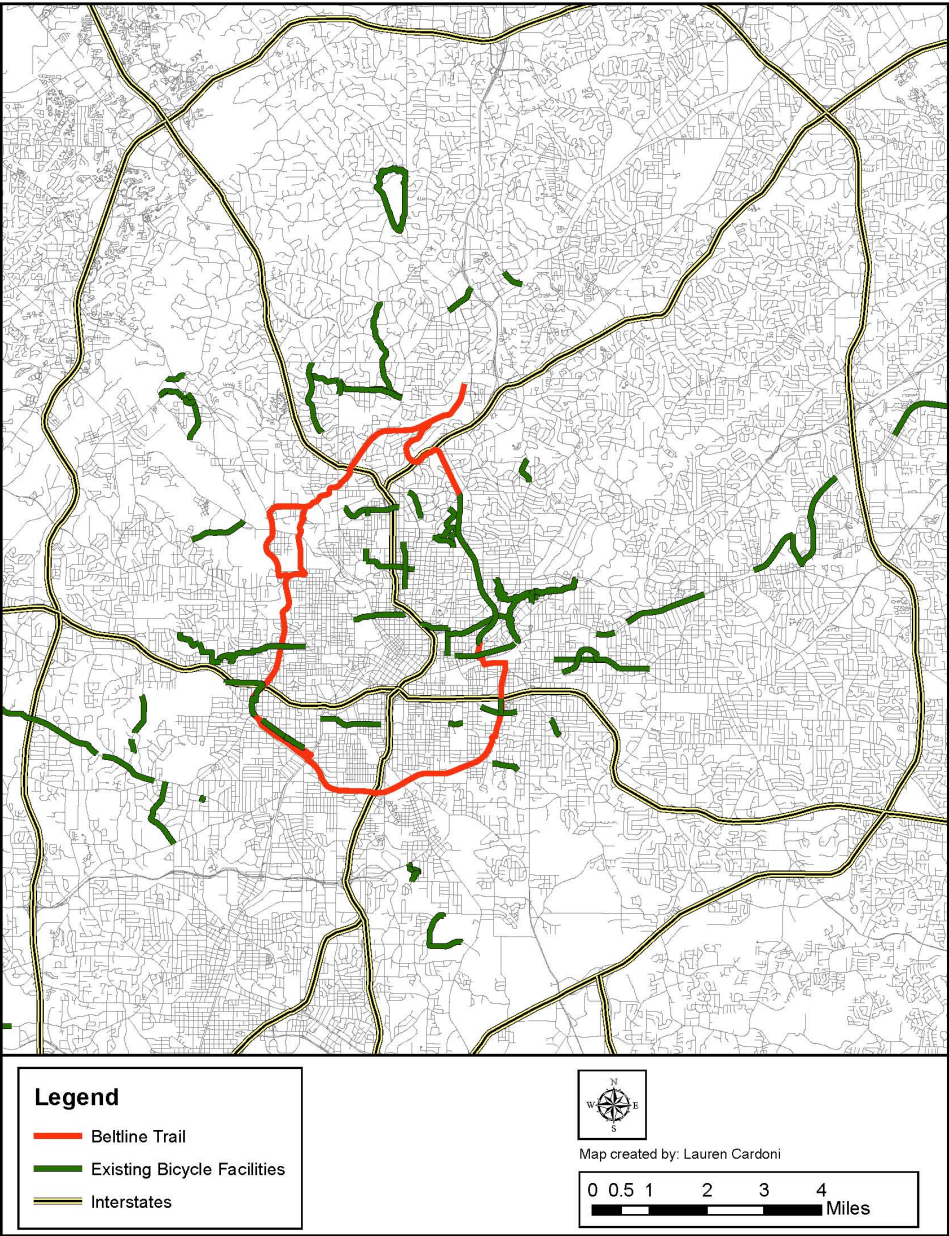
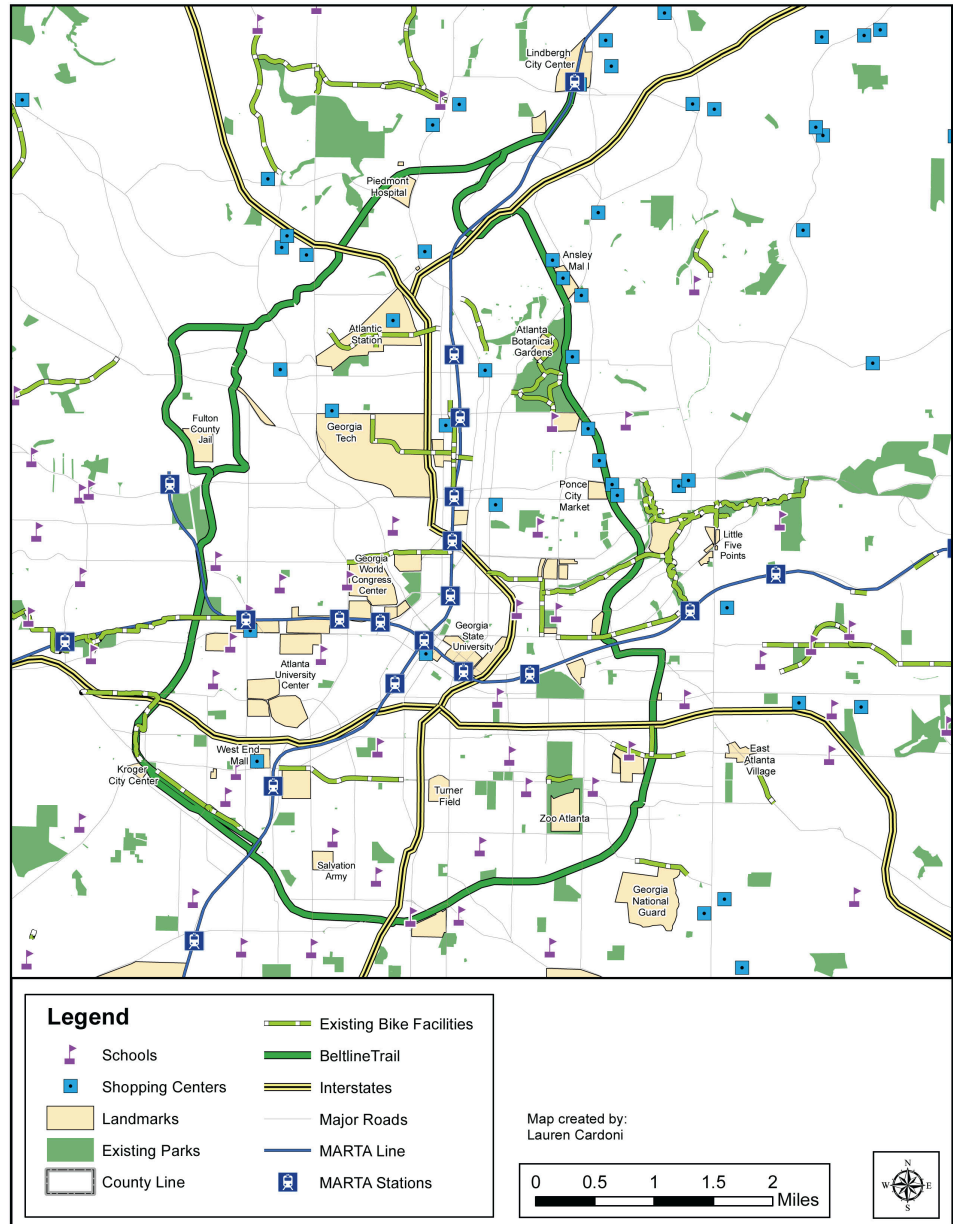


Figure 5. Map of Proposed BeltLine Trail and Surrounding Destinations

Many significant destinations lie along the BeltLine and within biking or walking distance from the BeltLine. With the construction of bicycle facilities to and from the BeltLine trail, many critical connections could be made for cyclists.

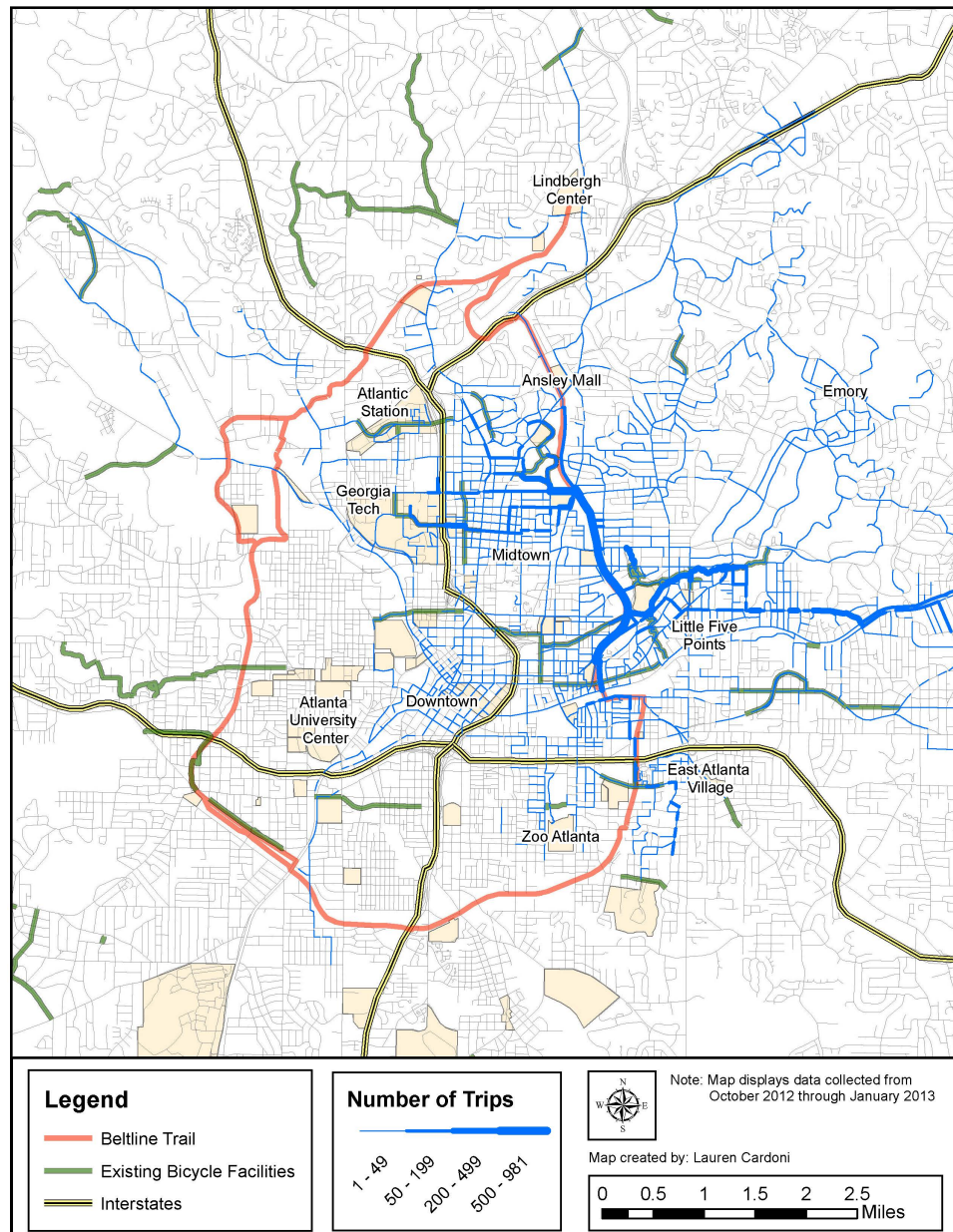


It is extremely costly, and not entirely practicable, to implement bicycle facilities on every single street in the city, so it is essential to identify crucial routes for cyclists that can feasibly be transformed to better accommodate them. The Cycle Atlanta data collected from October 2012 through January 2013 reports the trips that were made by cyclists using the smartphone application during that time period. Because the BeltLine is the focus of this research, only trips that made use of the BeltLine

Eastside Trail were utilized in the first part of this analysis. All of the trips using the Eastside Trail were mapped in GIS using graduated symbols to show the total number of trips made along each road or trail segment, which can be seen in Figure 6. The thickness of the blue line illustrates the approximate number of trips made along that road or trail.

Figure 6. Map of the Cycle Atlanta Trips Made Using the BeltLine Eastside Trail

The newly constructed BeltLine Eastside trail has shown very high usage by cyclists over the first few months of its opening. Much of this use is in conjunction with other trails and bike facilities that are directly connected to the BeltLine trail.



Unfortunately, as the map in Figure 6 shows, there are discrepancies in the data and minor errors in the analysis process that result in incomplete trips along certain road segments. As the trips move farther away from the Eastside Trail, the line thickness decreases because fewer trips are being made along those routes. Some of those trips are displayed as disconnected segments when they are, in fact, complete trips that at some point utilized the BeltLine Eastside Trail.

1. Are cyclists using the existing BeltLine Eastside Trail?

The map in Figure 6 presents information that implies riders utilizing the BeltLine Eastside Trail typically travel throughout the northern and eastern quadrants of Atlanta. It must be noted that it is quite possible this data holds a bias towards those who own smartphones and represents those who live or work in proximity to the BeltLine Eastside Trail. It is also entirely plausible that because the BeltLine Eastside Trail was opened around the same time the Cycle Atlanta application was released, there are a significant number of trips in this data that would not typically be made.

The greatest number of trips are made along the BeltLine itself, and in conjunction with the Freedom Parkway trail and Stone Mountain PATH. Over 900 trips were made along the BeltLine Eastside Trail, which is approximately 23% of the total trips recorded by the Cycle Atlanta application during the period. About 450 of these trips exited or entered the BeltLine by way of the Freedom Park trail with around 200 of those trips utilizing the remainder of the Freedom Park trail. Many trips also continue through Piedmont Park into northern Midtown and through the center of Midtown across to Georgia Tech.,

10th Street is highlighted by the map in Figure 6 as a fundamental access point for the northern end of the Eastside Trail, taking riders to and from the center of Midtown. About 500 trips utilized 10th street as an access point for the BeltLine,

with just over 100 continuing downtown 10th street, nearly 100 venturing north through Piedmont Park and more than 200 veering down 8th street. 8th Street acts as a secondary, but no less critical, connection from the Eastside Trail into Midtown. It looks as though many of the riders using this access point are also riding along the 5th Street bike lanes coming to and from the Georgia Institute of Technology campus. On the southern end of the Eastside Trail, the Freedom Parkway Trail and Krog Street are the primary access points for those trips made on the BeltLine. The Krog Street tunnel is one of few routes available for accommodating travel across the active freight yard, railroad and MARTA tracks. These facilities severely restrict any north-south travel on this side of the City. Nearly 400 trips are shown using the Krog Street tunnel, likely for this reason.

2. *How are cyclists using the existing BeltLine Eastside Trail?*

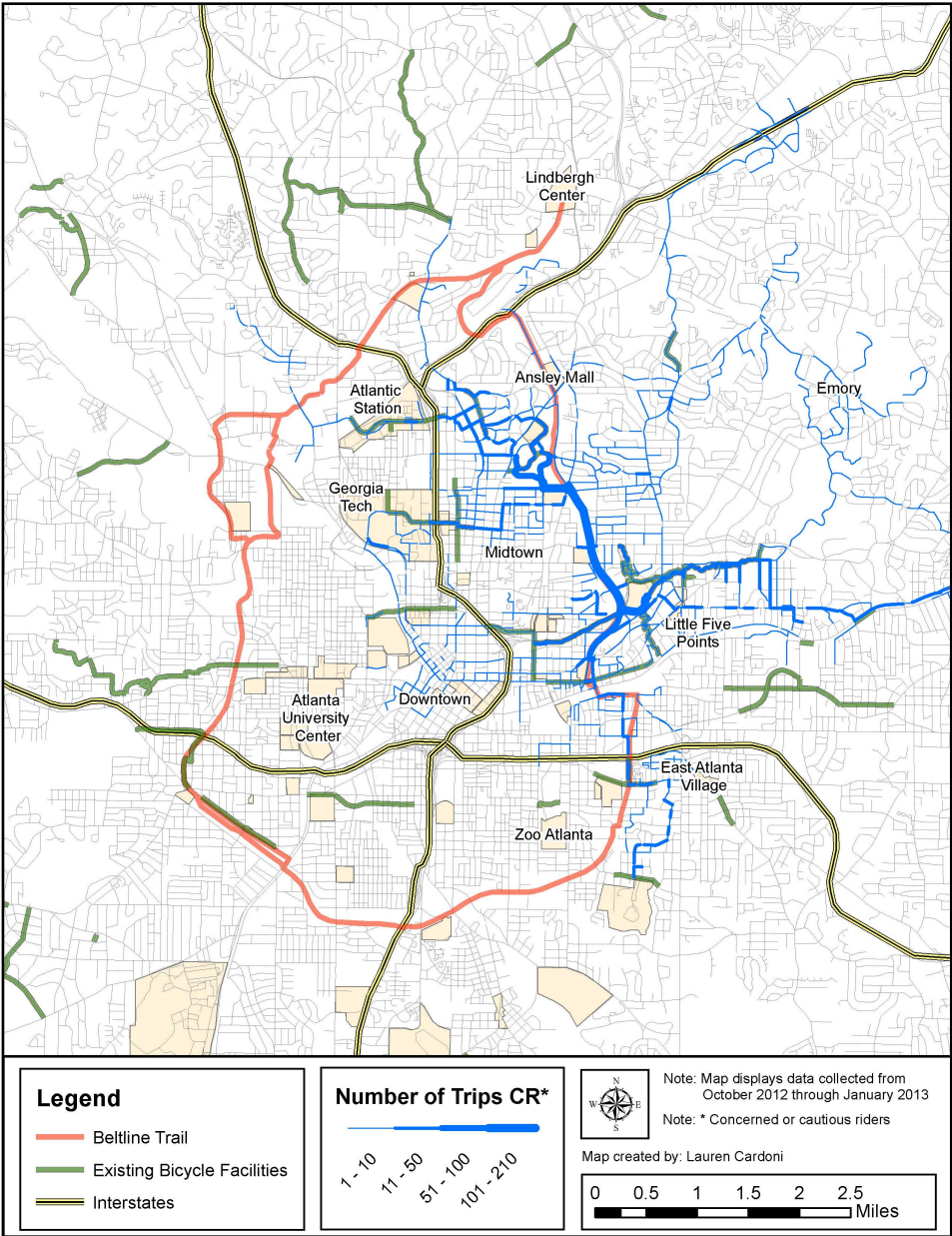
The Cycle Atlanta data not only includes trip information, but requests user-specific information to inform a number of different characteristics. A user can choose to submit personal information such as age, gender and income, but also how long they have been riding and what type of rider they consider themselves. After making a trip and recording it within the Cycle Atlanta application, the user can also select a trip type to submit with the data. This information was used to examine the previously displayed trip data more thoroughly.

A specific type of rider is typically identified when justifying the need for improved bicycle facilities. The “interested, but concerned” rider is one who may only ride when they feel safe and comfortable in their environment. Unfortunately, if the data was reported correctly, only 10 of 466 recorded users identify themselves as “interested, but concerned” and only 2 of those users rode along the Eastside Trail so this data is not robust enough to perform any statistically significant analysis. For this reason, 102 users identifying as “comfortable, but cautious” were added to the analysis; as the description implies, these riders are more comfortable with

cycling but prefer dedicated facilities. A total of 944 trips were made by these users, including those trips made independent of the BeltLine, equating to about 22% of all trips recorded during the data collection period. A much smaller number of trips made by riders of these two types utilized the Eastside Trail, and these are illustrated by the map shown in Figure 7.

Figure 7. Map of Trips made by Concerned Riders using the BeltLine

The “interested, but concerned” rider is the type of cyclist bicycle facilities are built for. Riders who identify themselves within that typology show high usage of the BeltLine trail and other in-town bicycle facilities.



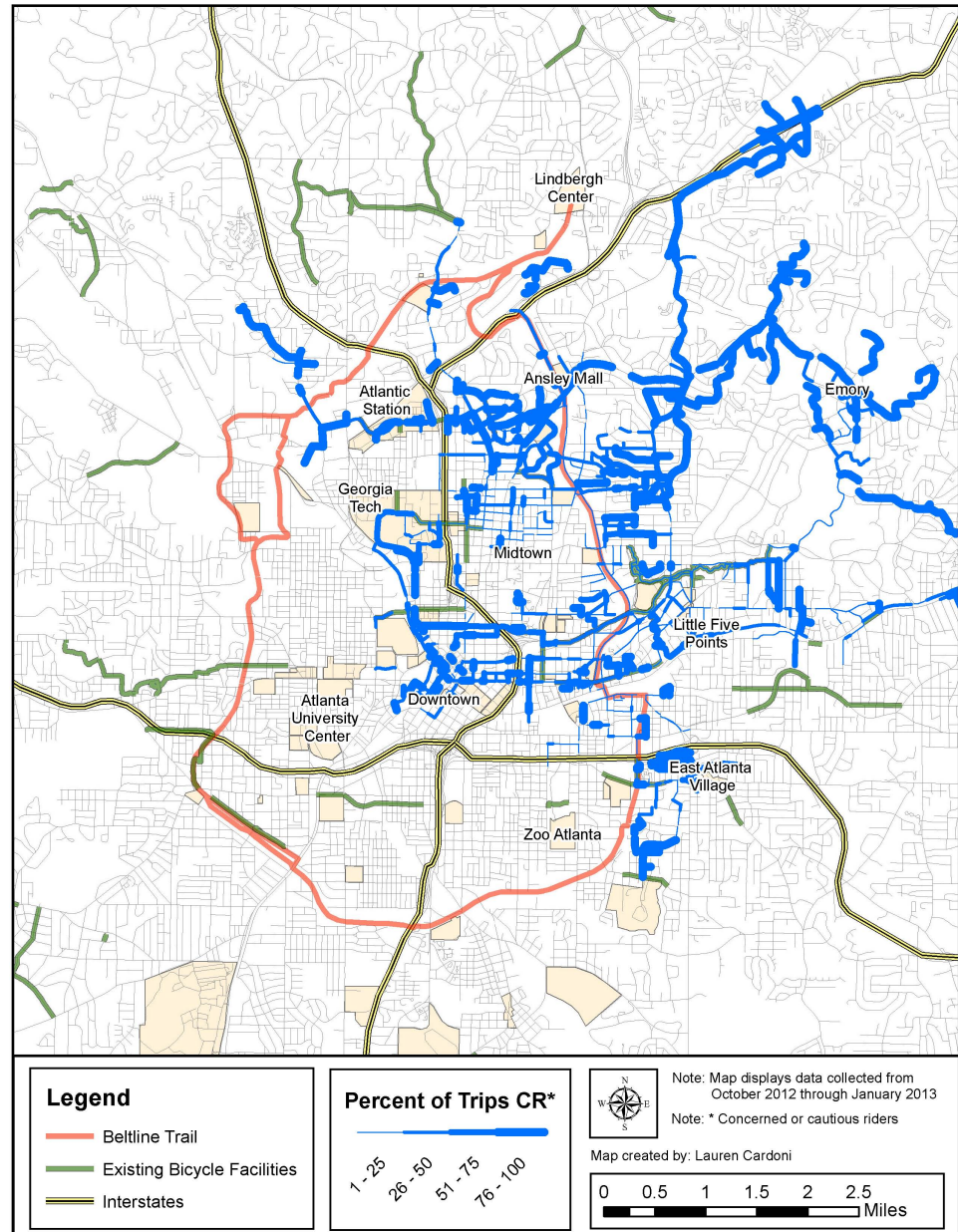
The riders who identified themselves as either concerned or cautious generally concentrated their trips along the shared-use pathways and slower-speed streets through neighborhoods. Critical connections to the BeltLine Eastside Trail are still 10th Street and the Freedom Parkway Trail; however, a new route connecting Peachtree St by way of 14th Street through Piedmont Park to the BeltLine has become evident as a choice for about 50 of these users. The *unpaved* portion of the BeltLine Eastside Trail along the eastern edge of Piedmont Park, which has the potential to serve as a replacement for riding on Monroe Drive, shows an unexpected amount of usage. 10 out of 56 trips along this segment of trail were made by those identified as concerned or cautious riders. This is noteworthy, as Monroe Drive is a higher-speed road that is not bike-friendly, but currently serves as one of few options for direct north-south routes. Providing alternate, safe facilities along these routes for concerned riders is a critical piece of encouraging more cycling in the city.

In an effort to understand how riders who consider themselves concerned or cautious are using the BeltLine Eastside Trail, the map shown in Figure 8 illustrates the percentage of total trips made by those users. It demonstrates the routes that are used by riders of these types and, where the blue lines are heaviest, identifies those routes on which a significant portion of the trips made were by these concerned or cautious users. It is apparent in this map that the collected data is not perfect and the methodology used to portray the number of trips may have contained errors, as the trip segments are fairly disconnected. Another important point to note, though not necessarily an error, is that it is quite possible some of the displayed trips were made multiple times by the same user; or the route may have had only a single trip that was recorded by a concerned rider, producing a result of 100%. These biases can skew how the data is displayed in the map, showing large values where there are actually very few trips being made. However, through

careful analysis it is still possible to suggest there are certain routes that concerned riders prefer more than other rider types.

Figure 8. Map of Trips by Percentage of Concerned Riders using the BeltLine

The percentage of riders on any facility that are of the “interested, but concerned” typology tells us what types of facilities those riders feel most comfortable on.



The shared use paths throughout Piedmont Park have a fair amount of usage, being so near a main access point to the Eastside Trail, but more than 50% of the trips being made through the park are recorded by concerned or cautious users. Many of

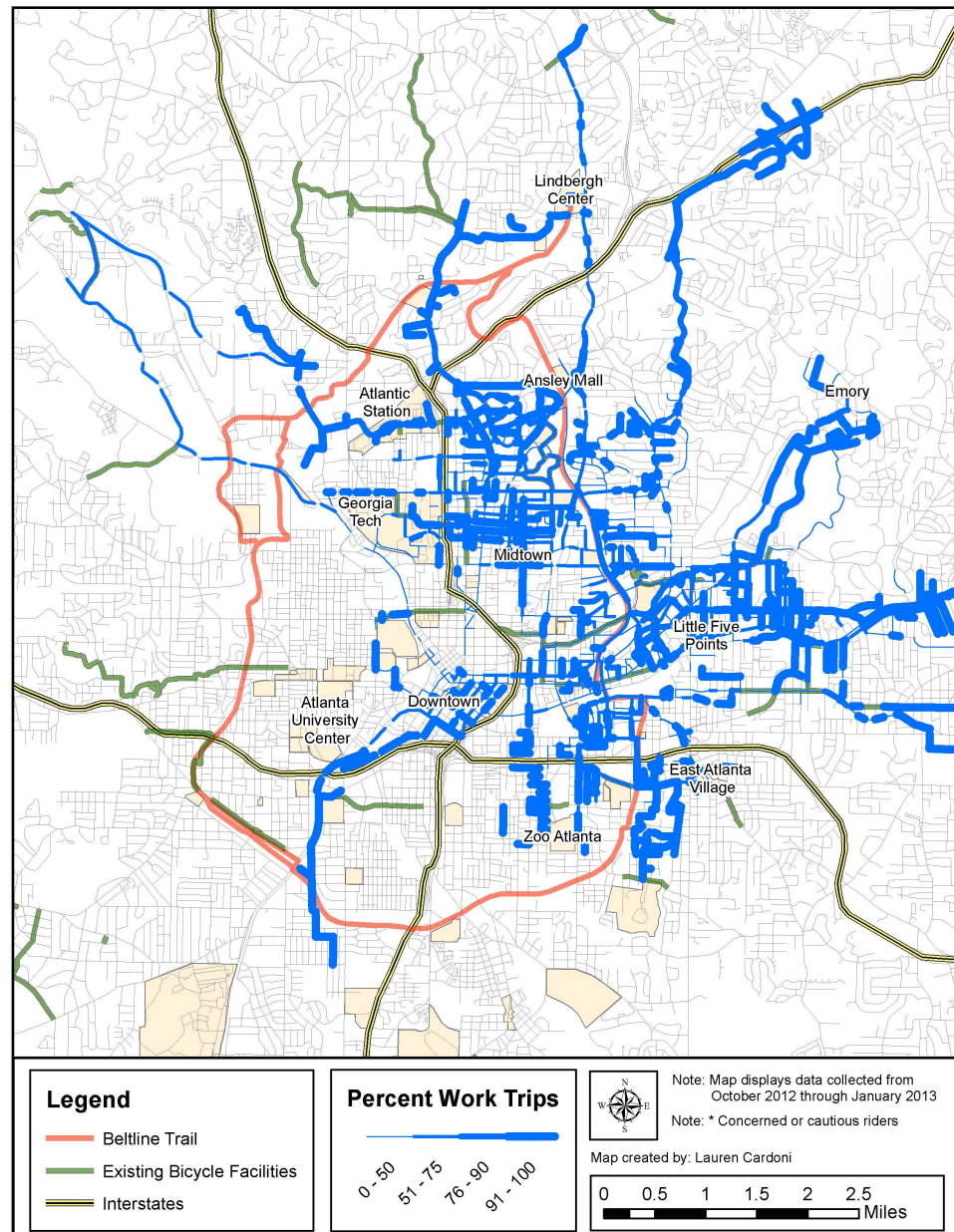
these trips then proceed either to the BeltLine or through the Ansley Park neighborhood, indicating a preference for dedicated facilities and less busy roads. Because of the large number of total users riding along the BeltLine, the percentage of those identifying as concerned or cautious appears meager. However, there are 200 of these rider types who took the BeltLine, equating to just over 20% of the total BeltLine users. The Freedom Park Trail also carries a number of these riders to and from downtown, with the concerned or cautious users making approximately 35% of all trips on the portion of the trail inside the BeltLine.

Most of the trips illustrated above 75% in the Emory area are representative of the bias in the data mentioned previously; the routes were only used by one or two riders, all of whom identified as concerned or cautious users. The same holds true for the trips along 17th street through Atlantic Station as well as the two clusters of trips near East Atlanta Village. However, the segment of Edgewood Avenue with bike lanes displays a number of trips, of which approximately 35% were made by concerned or cautious users. These bike lanes connect users to the Freedom Park Trail and, by way of Dekalb Avenue, to the Stone Mountain PATH system. The route to Stone Mountain displays over 100 trips, with about 30% of those recorded by concerned or cautious riders. These statistics, yet again, indicate a preference for dedicated facilities by those who are less comfortable riding a bicycle.

Extracting only those trips identified as commute trips and mapping them was another essential step in this analysis. If the BeltLine demonstrates potential influence on the number of people cycling to work, it could symbolize a critical shift in mode share for Atlanta. The map shown in Figure 9 displays the percentage of trips reported as “commute” utilizing the BeltLine Eastside Trail throughout the data collection period. Depending on whether or not users are logging their trip type correctly and the data is representing it accurately, this could indicate a noteworthy opportunity.

Figure 9. Map of Percentage of Work Trips made using the BeltLine

A primary reason for constructing bicycle facilities is to allow more people to commute by bicycle. Identifying what facilities those cyclist commuters currently use will help to determine necessary improvements in the network.



According to this map, a vast majority of trips made utilizing the BeltLine Eastside Trail were for the purpose of commuting. Approximately 75% of all trips along the Eastside Trail were commute trips and a large number of those constitute a majority of trips made on other routes in conjunction with the BeltLine. It is evident that connecting the BeltLine into other parts of the city with dedicated bicycle facilities could produce an increased rate of commuting by bicycle. Some of the more popular

routes include: Mclendon Avenue with over 100 trips and nearly 100% of them being commutes; 10th Street also with over 100 trips and about 75% commuters; and 8th Street with numbers similar to that of 10th St, carrying commuters through the Midtown neighborhood.

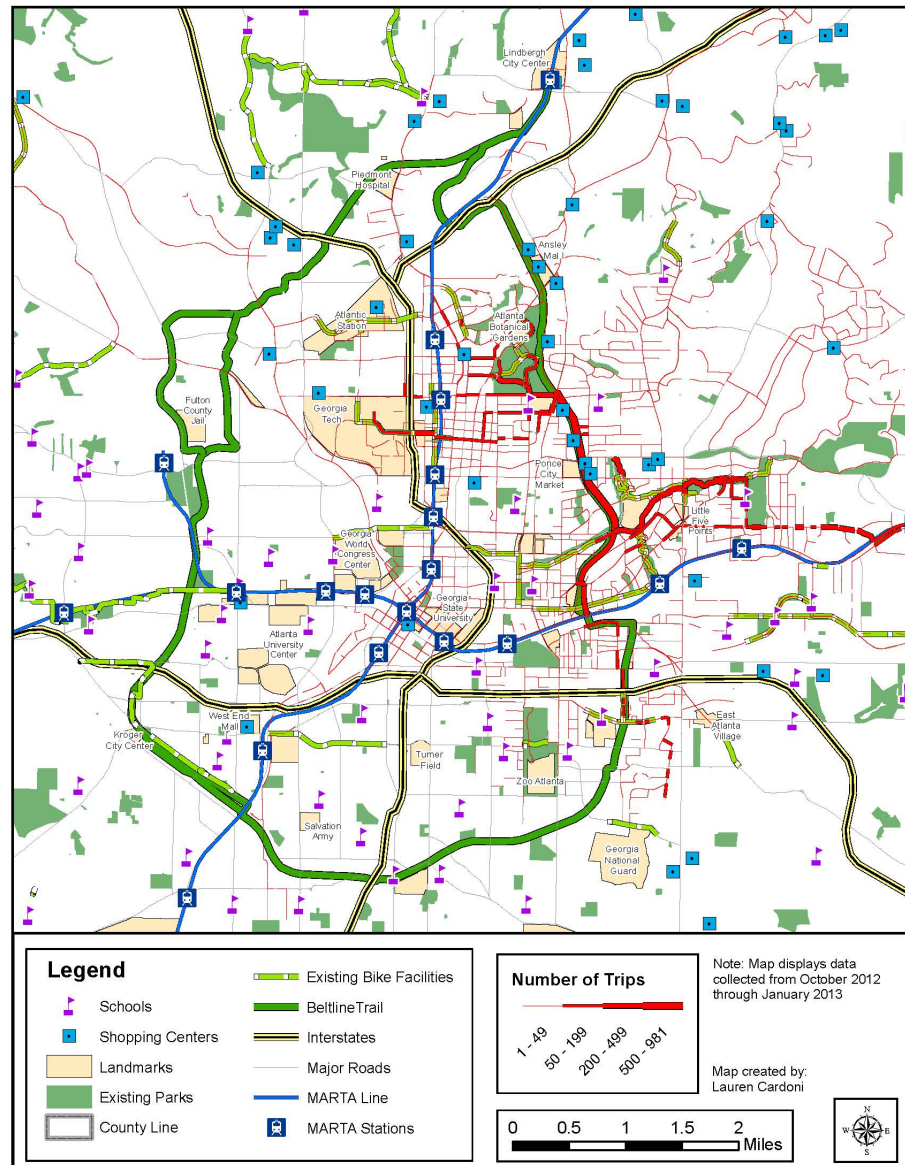
Peachtree Street north of 10th Street also shows a notable amount of usage, in contrast to West Peachtree Street and Spring Street, which are the only other options for traveling north or south and display almost no commute trips. Peachtree Street north of Interstate 85, Piedmont Road and Lenox Road all stick out as primary north-south routes that are serving as major commuting corridors. Dekalb Avenue and its connection to the Stone Mountain PATH system is also highlighted as a critical route for commuting cyclists with around 200 trips approaching a 100% commute rate. The interesting link between all of these trips is their use of the BeltLine Eastside Trail to reach their final destinations.

3. Is the existing BeltLine trail connecting cyclists to particular destinations?

Riders using the BeltLine Eastside Trail are shown to be utilizing the trail for only a portion of their trips, continuing on to many other destinations. As previously discussed, cyclists are traveling in all directions through and across the city to take the BeltLine Eastside Trail, whether or not it is actually on the way to their destination. With a multitude of attractions, parks and other destinations surrounding the BeltLine, as shown in Figure 10, it is critical to identify which of these it is currently serving and if there are others it may have the potential to serve through improved connectivity. It is difficult to pick out individual user IDs and trace exact routes taken by each user, so much of this analysis is generalization. Thus the map in Figure 10 illustrates general areas of town that are currently being connected to cyclists by way of the BeltLine Eastside Trail.

Figure 10. Map of Trips Made Using the BeltLine and Various Destinations

The BeltLine Eastside trail currently serves a multitude of different trips and trip types. It is possible to take the Eastside trail to many significant destinations around town.

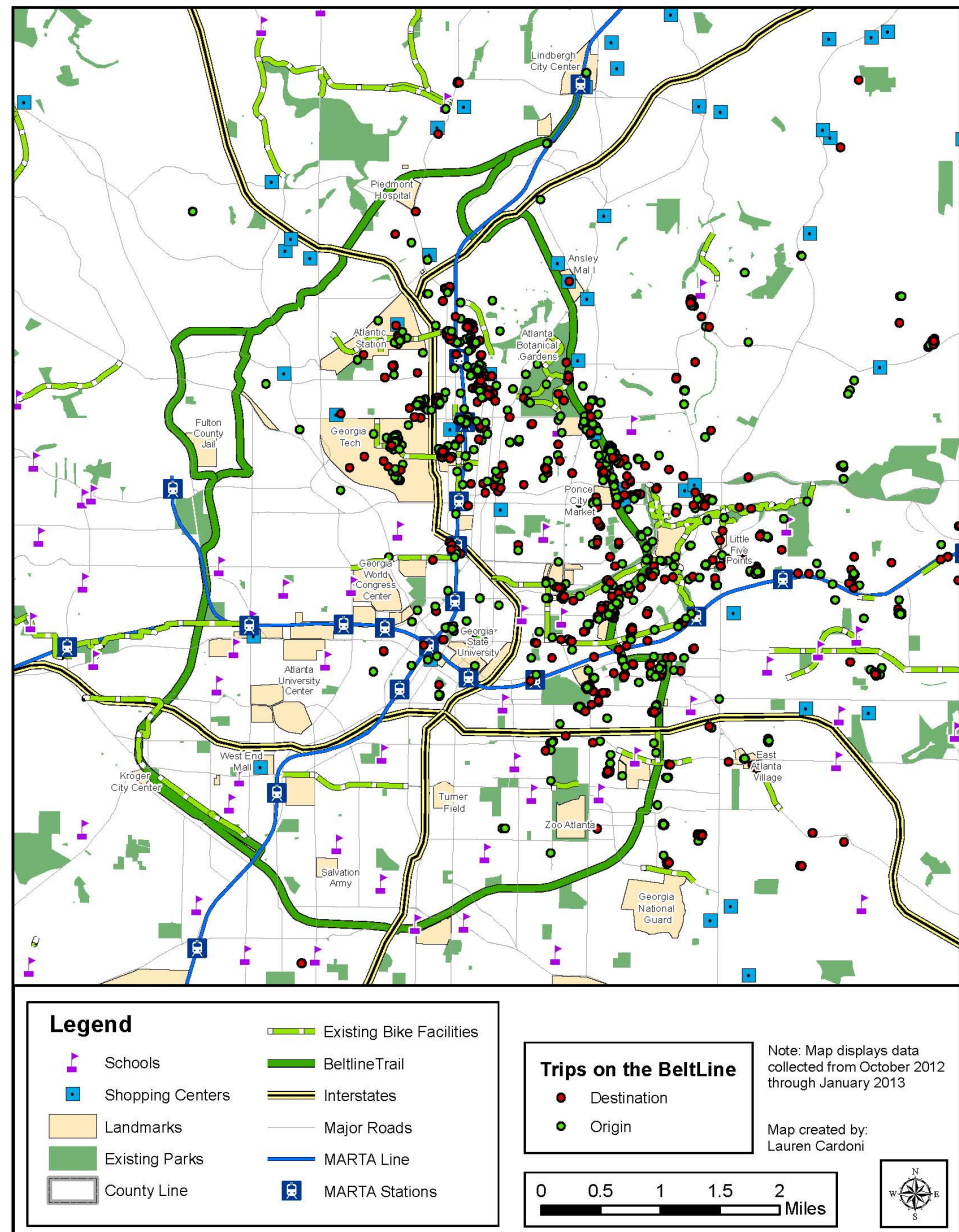


Cyclists are utilizing the BeltLine Eastside Trail in conjunction with their travels through Atlantic Station, Georgia Tech, Downtown Atlanta, much of Midtown, Piedmont Park, East Atlanta and beyond. Some trips even extend out towards the perimeter in multiple directions. A brief analysis of this map offers little conclusive evidence without observing the actual origins and destinations of the recorded trips. These locations can be seen in Figure 11, revealing that a vast majority of the trips

made using the BeltLine Eastside Trail begin and end on the eastern side of Atlanta. Very few trips have origins or destinations west of the interstate.

Figure 11. Map of Recorded Cycle Atlanta Trip Origins and Destinations

Identifying the origins and destinations of all trips made using the Eastside trail will help to determine what areas are in need of bicycle network improvements.

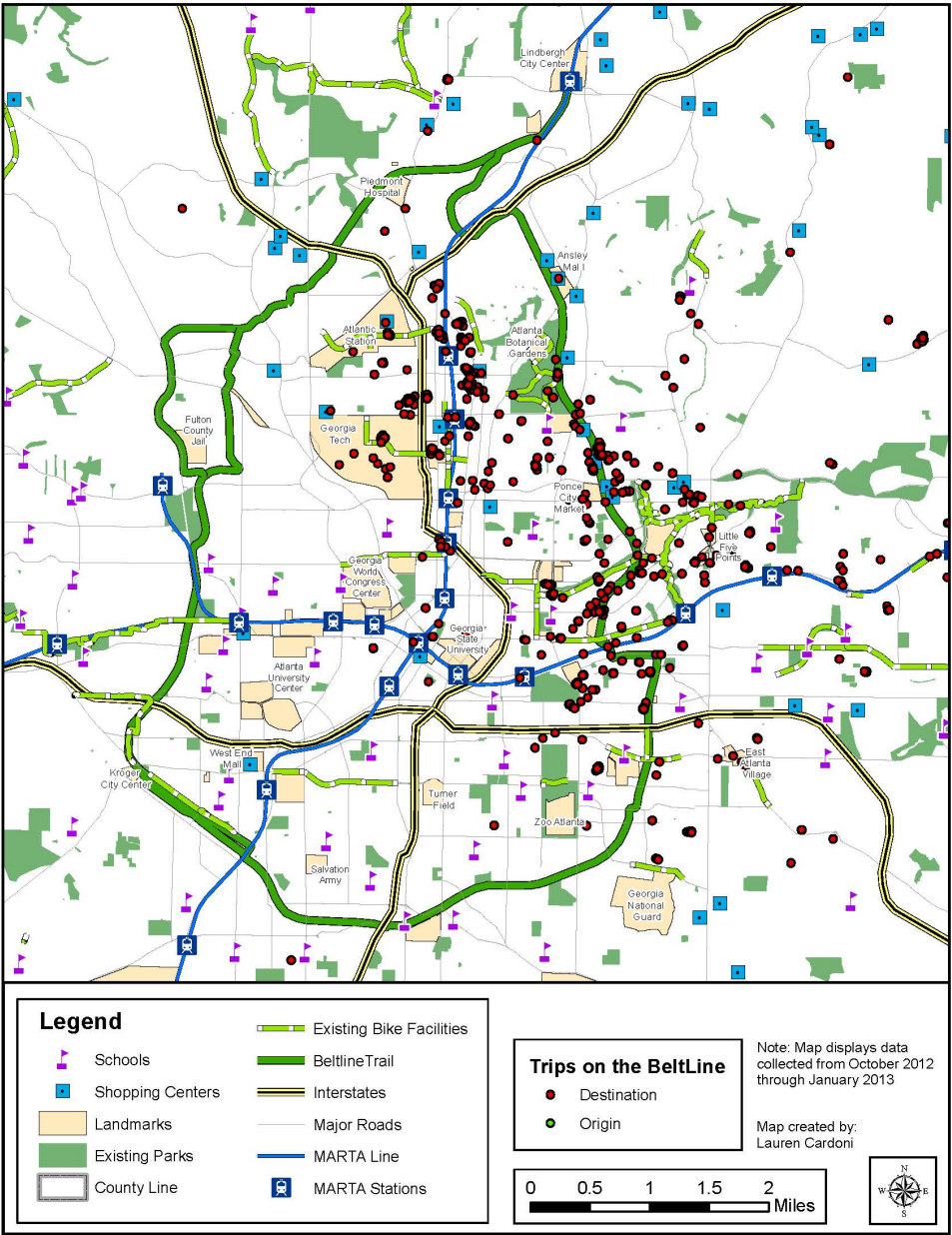


The BeltLine served a total of 2142 origin and destination points. For those trips that traveled west of the interstate, there are 3 primary locations representing

origin and destination alike; Atlantic Station had 22 destinations and 16 origins, Georgia Tech had 59 destinations and 57 origins, and the Central Business District in Downtown had 10 destinations and 26 origins. In order to better understand what destinations the BeltLine is connecting cyclists to, the points of origin were removed from the map and only the trip destinations are displayed on the map in Figure 12.

Figure 12. Map of Recorded Cycle Atlanta Trip Destinations

Trip destinations are of particular importance because it is critical to understand where cyclists are going in order to better serve their trips with dedicated facilities.



Compared to the west side of the interstate, the eastside is much better served by the BeltLine Eastside Trail. There are a couple of significant employment centers in the Midtown area that are well served by the BeltLine Eastside Trail and show up as primary destinations within the recorded trip data. Over the data collection period, the core of Midtown served as a destination for 82 trips utilizing the BeltLine, and the area of Midtown north of 10th Street served as a destination for 100 trips utilizing the BeltLine. A fair amount of shops and other retail attractions along the BeltLine Eastside Trail are also illustrated as popular destinations, with over 200 destination points on or directly adjacent to the BeltLine.

4. Could the existing Eastside BeltLine trail be used to serve other trips?

As shown in Figures 6, 7, & 8, the BeltLine Eastside Trail has potential to serve as a substitute route for cyclists traveling north or south along roads such as Piedmont, Monroe, Boulevard, etc. The maps reveal that even the unpaved portions of the BeltLine are being used to connect destinations on either end. It is also evident that users are traveling a longer distance in order to take the BeltLine instead of city streets to their destination. The Eastside Trail serves as a much more pleasant route connecting Midtown and East Atlanta than any of the city streets a cyclist may have had to take before. With the creation of bicycle facilities linking into and out of the city, the BeltLine could easily be more accessible and more convenient as a replacement route for many streets.

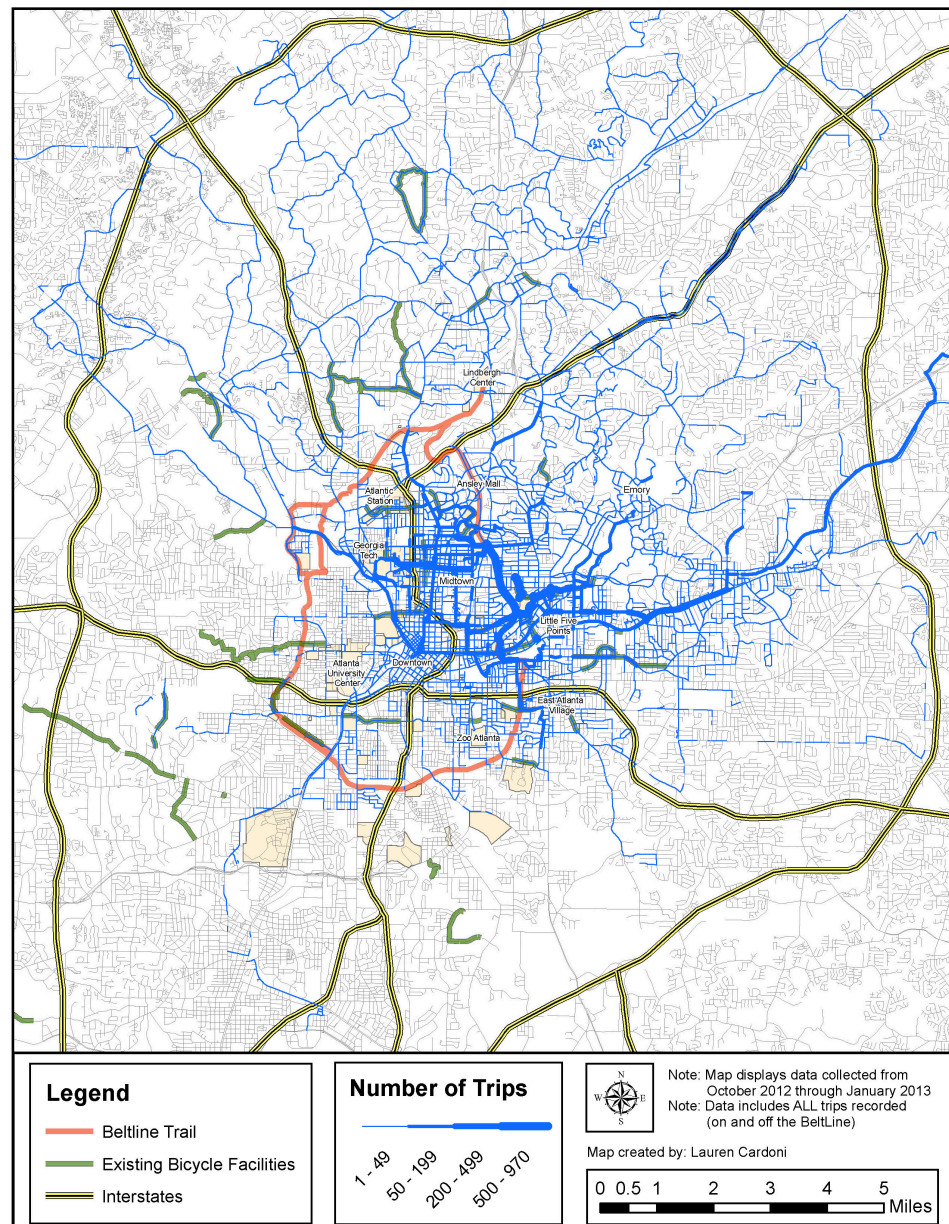
5. Does the remainder of the BeltLine show potential to be used when completed?

As previously mentioned, unpaved portions of the Eastside Trail are already in use by riders who wish to reach destinations on either end of the trail. In order to analyze the potential in the remainder of the proposed BeltLine loop, all of the Cycle Atlanta trip data was geocoded and is displayed in Figure 13. This map illustrates the immense distances being traveled by cyclists throughout the Metropolitan

Atlanta region. Many recorded routes extend from the core of the city, out to all areas of the BeltLine and beyond; some of these trips even reach the perimeter highway, showing potential for regional connections to the BeltLine. The Stone Mountain trail in particular demonstrates how effective a connected bicycle facility can be for encouraging ridership.

Figure 13. Map of All Recorded Cycle Atlanta Trips

Looking at the metropolitan region at a larger scale introduces possibilities for a more regional network of bicycle facilities. A regional network could contribute to longer distance commuting by bicycle and reduce strains on an overly congested road network.



In this map, it is apparent that there are areas in proximity to the BeltLine that have very little street connectivity for various reasons; this could be a result of the original railroads, as it is to the northwest, or just a lack of the grid framework that provides connectivity in other areas of the city. This lack of connectivity is a challenge for cycling, as it creates longer distances to travel in order to reach final destinations. However, the BeltLine has the potential to serve as a bridge across these areas and link cyclists to streets that are not currently connected. Essentially, the BeltLine can serve as the thread integrating the existing urban fabric.

6. What locations does/will the BeltLine serve?

Midtown is already evident as a primary location benefiting from access to the BeltLine trail. The Inman Park area also benefits from a substantial access point along the existing BeltLine Eastside Trail. Many of the West and South Atlanta neighborhoods stand to benefit from the expansion of the BeltLine trail as well; especially those with limited access to vehicles and a high percentage of residents who walk or bike to work. With approximately 78% of all recorded trips made independently from the BeltLine Eastside Trail, there is a large percentage of trips that could be better served by a more connected bike network.

RECOMMENDATIONS

Based on the results from this analysis, there are many recommendations that can be made for a future bike network. A critical next step would be a supplementary evaluation of traffic flow rates in conjunction with the available trip data. It is difficult to suggest removal of vehicular lanes for implementation of bicycle facilities without knowing the effect on traffic flow. However, the following discussion aims to identify potential steps or guidelines for future actions that can be taken to make Atlanta a more bike-friendly city.

OPPORTUNITIES

The BeltLine trail system has the potential to serve as a connecting thread in the existing fabric of the city, especially in those areas lacking a connected street grid. Construction of a bicycle and pedestrian path along the BeltLine right-of-way offers a significant opportunity for increasing accessibility for these two modes of transportation. Connecting the BeltLine across and throughout the city with “feeder” bicycle facilities would provide the framework for an extensive bicycle network and could greatly impact the convenience of cycling in Atlanta. With the percentage of cyclists shown to be riding for commute purposes, it is evident that a network connecting Atlanta residents to their employment locations by way of dedicated bicycle facilities could have a critical impact on mode share for the city.

INTEGRATION

Throughout the preceding research analysis section, certain routes were highlighted as primary cycling corridors that could benefit from improved facilities providing linkage to the BeltLine. However, as previously discussed, it is difficult to recommend specific routes for bicycle facilities without supplementary analysis of traffic data. An argument can be made that certain streets should be designed for traffic throughput, while others should promote alternative modes of transportation over the automobile. For instance, many cities dedicate residential and other local streets to cyclists through various techniques, including restructuring them as bicycle boulevards and implementing traffic calming elements. Policy decisions must be made in Atlanta on what type of streets should endure and what the vision for those streets may be.

In reference to the “types” of streets cities can choose to create and what the vision for development may be, New York City offers a superior example with its famous Broadway strip. Broadway, however, is not the only street in New York City that has been redesigned for all users. Over the last few years, the city of New York has

developed street design guidelines for future planning and development that emphasize a particular vision. The vision New York City is focusing on is one that promotes biking and walking as a principal mode of transportation. Vehicular travel lanes are being removed all throughout the city to accommodate cycle tracks and pedestrian spaces, such as those shown in Figure 14, to discourage driving on local city streets.

Figure 14. Google Street View Photos of Broadway & East 17th St.



Atlanta could benefit from a guide of recommendations for planning future street design and bicycle network expansion, which this research aims to support. Initiatives of various sizes have undertaken the challenge of creating a vision for significant Atlanta streets, with the Midtown Mile being one of the more prominent examples. Overhauling Peachtree Street from Downtown to Buckhead, as seen in Figure 15, has long been a vision for redevelopment and an attractive future, but has yet to take hold in any official city plans. These kinds of ideas are what is lacking in Atlanta and could provide guidelines for future development. Having a resource to look to for how a street can and should be transformed to encourage more biking is essential for the success of any bike network. In order to successfully integrate the BeltLine into the city fabric and expand it into a larger network of bike facilities, guidelines for how to re-design critical street connections are crucial.

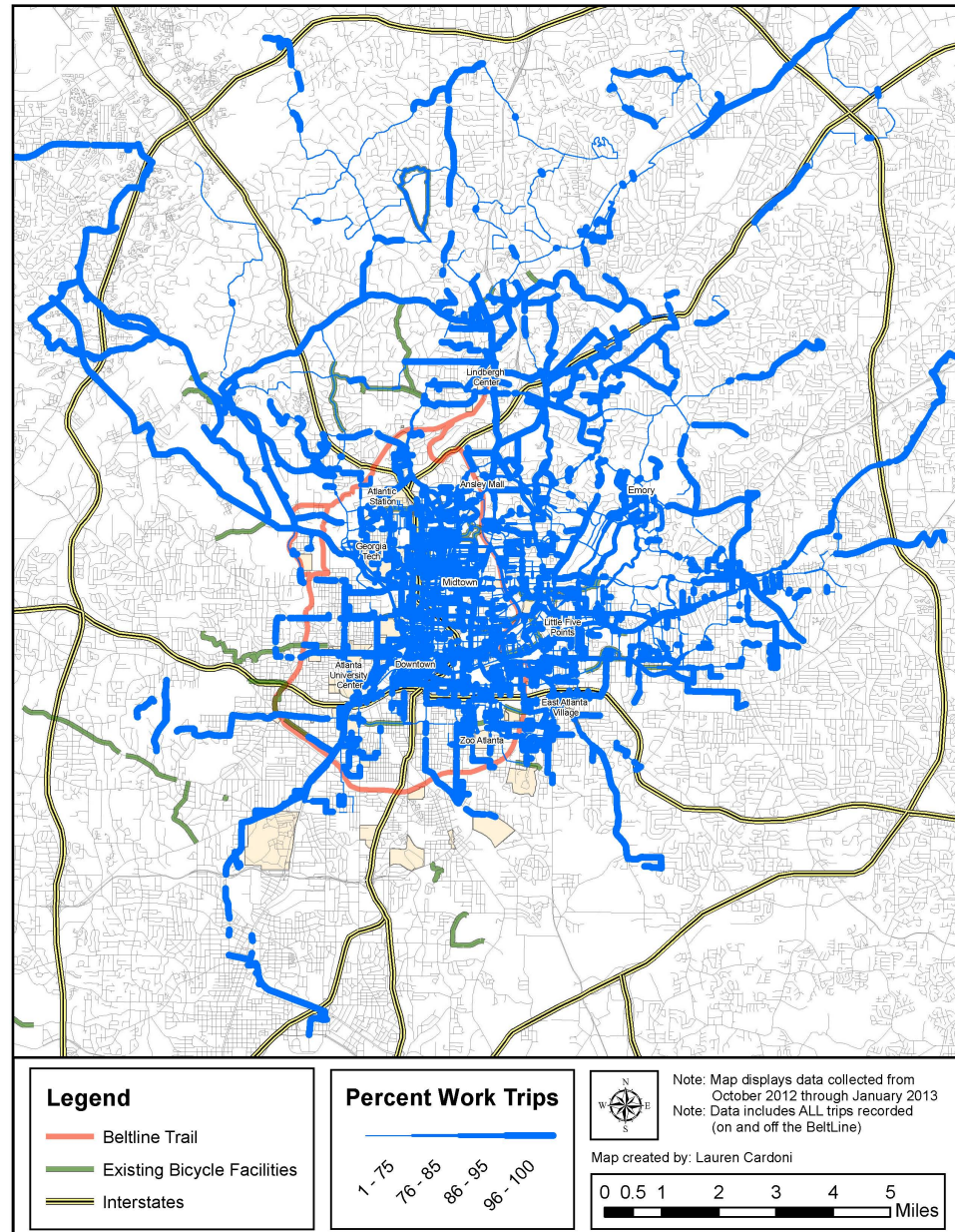
Figure 15. Image of the Peachtree Corridor from www.urbancollage.com



As mentioned previously in the discussion of Figure 13, showing the larger metropolitan area and the recorded bicycle trips throughout, there is potential for an extensive regional trail system to support cycling. Further analysis of all trip data, including those trips made independent of the BeltLine Eastside Trail exhibits this potential. With 112 of 466 total users identifying as “interested, but concerned” or “comfortable, but cautious” they represent 24% of all cyclists logging their trips with Cycle Atlanta. As shown in the analysis, these users display a preference for existing dedicated facilities over other available routes. It is quite possible that a larger, more integrated bike network could encourage more of these types of riders to bike. Another significant statistic is the number of cyclists reporting their trips as “commute” trips. According to the data, 2607 of all 4208 trips were logged as commute trips, indicating that 62% of all trips made throughout the 4-month data collection period were for commuting purposes. The map shown in Figure 16 displays the percentage of all trips made throughout the region that were logged as “commute” trips.

Figure 16. Map of Percentage of Work Trips made throughout Atlanta

Looking at the percentage of trips made as work commutes across the metropolitan region illustrates a regional network really benefit the transportation system. If there were regional facilities that more riders could use, it's possible many current vehicular trips could be replaced by bicycle trips.



Based on the high percentage of trips made along the BeltLine Eastside Trail for the purpose of commuting, it would seem the corridor could benefit from prioritization of use; a separate trail for commuter cyclists, or just cyclists in general based on total usage of the existing trail, could make trips more efficient and encourage more. It is also apparent that cyclists and pedestrians alike are forging their own connections to various facilities adjacent the Eastside Trail, carrying bikes down

hills and creating “goat paths” between properties in order to access destinations on either side of the corridor. The potential for actually connecting these users to those destinations should be addressed, if only for liability reasons. While the BeltLine itself shows potential for creating connections and serving existing as well as new trips, it could also benefit from extensions in the east-west direction for further integration into the urban fabric. The Westside trail could very easily link into the BeltLine and extend into Downtown, straight across to the Freedom Parkway trail and on into the Stone Mountain PATH. With the infrastructure investments to come with the new Falcons stadium and the PATH project expanding down John Portman Boulevard, these cross-town connections are viable under a more holistic vision.

ORGANIZATIONAL SUPPORT

Much of the transportation planning responsibility within Atlanta is relegated to the metropolitan planning organization, known as the Atlanta Regional Commission (ARC). The ARC operates as the regional planning agency for the 10-county metropolitan area. In June of 2011, the ARC released Plan 2040, the comprehensive development plan for the metropolitan Atlanta region. This plan included a Regional Transportation Plan (RTP) that delineates available and forecasted funding to an approved list of transportation related projects for the region. Currently, about 2.5% of the forecasted budget for the region through 2040 is allocated for use on bicycle and pedestrian infrastructure, which is much greater than any previous funding for such projects (The Atlanta Regional Commission, 2011). With just over \$1 billion apportioned for bicycle and pedestrian projects regionally, Atlanta is surpassing the funding allotted by Denver in its Regional Transportation Plan.

Canadian cities differ in that they distribute the majority of bicycle and pedestrian funding from the City Capital Budget rather than at a regional level. As discussed in the literature review, Vancouver City Council approved a \$25 million plan in 2010 for bicycle projects, while Calgary allocated \$126 million of a 10-year budget for

bicycle and pedestrian projects. In comparison, the City of Atlanta has recently announced that it will provide \$2 million for the construction of high quality bicycle facilities in the city by 2014 (“City of Atlanta Bicycle Transportation Initiatives,” 2013). This is one of the first substantial efforts the city government has put on the table for cycling improvements.

At a more local level, organizations that manage the Community Improvement Districts (CIDs) throughout Metropolitan Atlanta are instrumental in achieving general improvements within those districts, including streetscape enhancements and the like. These organizations are in a position to influence and guide implementation of bicycle facilities at the smaller scale. Through a collaborative effort between these organizations, planning of a more comprehensive, connected bike network is entirely feasible. They also have the ability to assemble and contribute funding towards bicycle improvement projects. The two primary organizations within the core of Atlanta are Midtown Alliance and Central Atlanta Progress, managing the Midtown and Downtown districts respectively.

Locating funding for bicycle facility improvements is, unfortunately, the biggest challenge for any city. Many of the federal and state programs that previously provided funding for bicycle and pedestrian projects had been cut or consolidated into smaller budgeted programs. Congestion Mitigation and Air Quality (CMAQ) funds have long been a source for bicycle and pedestrian projects, along with Safe Routes to School and other SAFETEA-LU programs. Under the new legislation for MAP-21, many of these program budgets merged and have reduced funding and more stipulations as a result. Going forward, local funding is going to be a significant part of financing bicycle and pedestrian improvements. Innovative new programs will be a critical factor in gathering funds for bike network expansion. As cited in the literature review, cities with successful bike networks have delineated chunks of the capital budget away from road projects toward bicycle and pedestrian

improvements. States like Colorado have long employed programs like GOCO, which pull funding from unrelated sources like state lotteries.

PERFORMANCE

As evidenced by the case study cities, among various others, a well-connected and extensive bike network contributes to higher ridership. Cities with higher rates of cycling and, thus, greater mode split, are shown to be much healthier and more livable. Atlanta is currently sitting at a pivotal crossroad, with so much potential at the city's fingertips. Between the backbone of infrastructure available for bike facilities and the ability for cyclists to easily extend feasible trip distances through the use of MARTA, the city has the opportunity to significantly impact mode share and get people out of their cars.

CONCLUSION

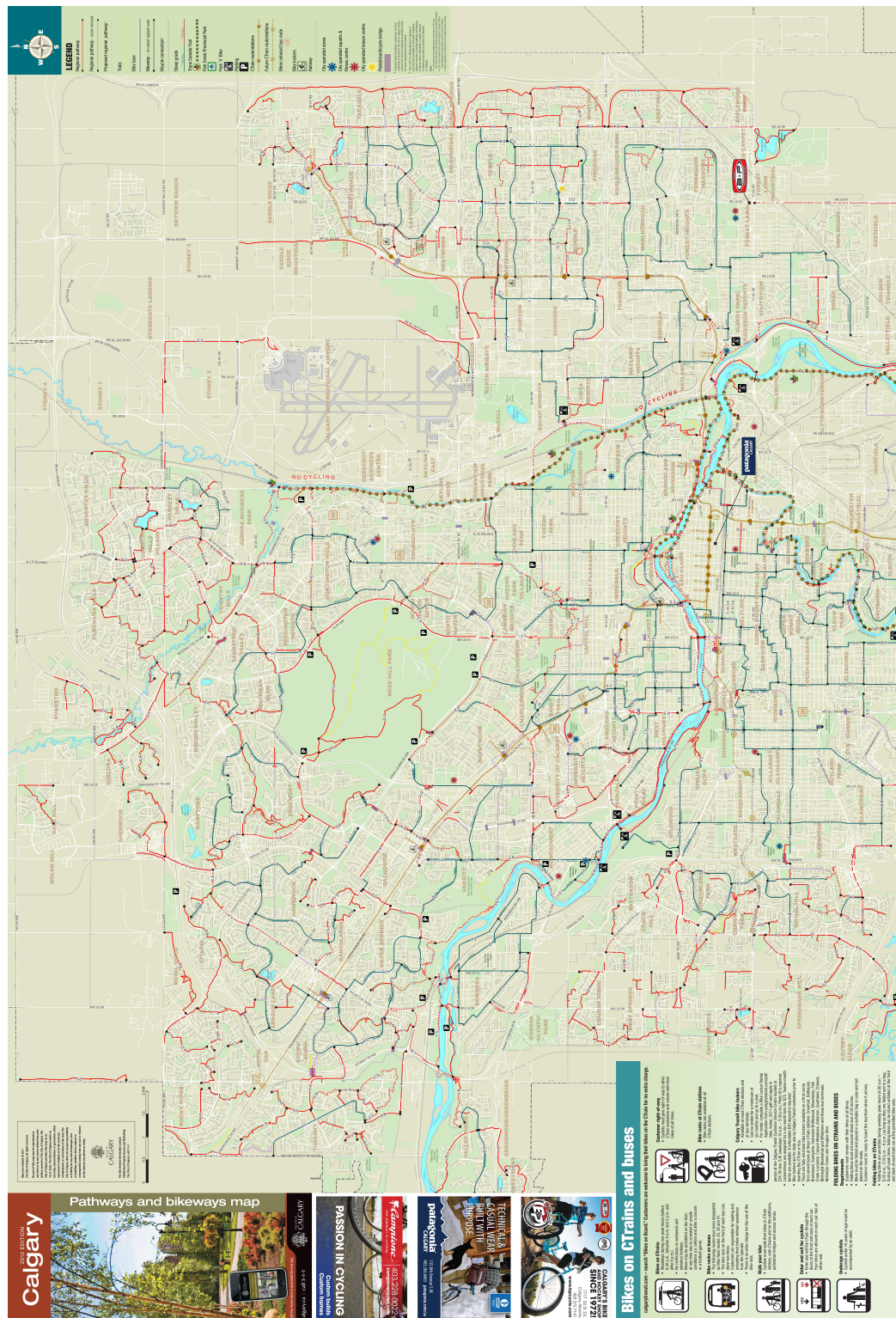
The City of Atlanta should shift its focus to utilizing the BeltLine as a foundation for a larger, more integrated bicycle facility network. The potential it holds for linking cyclists throughout the city is immense and could instigate a significant mode share increase for cycling. Observing the success from other cities, such as Denver, Calgary and Vancouver, it is very possible for the BeltLine to thread its way into the urban fabric and provide safe, convenient routes for all types of riders. With such a large portion of daily trips being shorter than the average distance traveled by cyclists, the availability of this infrastructure could be a substantial solution for the transportation challenges in Atlanta.

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APPENDIX A. CALGARY PATHWAYS AND BIKEWAYS MAP 2012



APPENDIX B. DRCOG BICYCLE FACILITY INVENTORY 2009

